# Science, Biases, and the Threat of Global Pessimism

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Philip Kitcher rejects the global pessimists' view that the conclusions reached in inquiry are determined by the interests of some segment of the population, arguing that only some inquiries, for example, inquiries into race and gender, are adversely affected by interests. I argue that the biases Kitcher believes affect such inquiries are operative in all domains, but the prevalence of such biases does not support global pessimism. I argue further that in order to address the global pessimists' concerns, the scientific community needs criticism from people with diverse interests and background assumptions.

**1. Introduction.** The Strong Programmers have given us a pessimistic view of scientific knowledge and inquiry, suggesting that evidence plays an insignificant role in resolving disputes in science, thus implying that the conclusions reached in inquiry come to be accepted because of the interests they serve (see Barnes, Bloor, and Henry 1996).[1] Philosophers of science are reluctant to accept such a pessimistic account of science. Philip Kitcher, for example, has developed an alternative account of scientific inquiry that acknowledges the effects that interests can have on science.

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1. In all fairness to the Strong Programmers, the view ascribed to them here may not accurately reflect their own view. This view, though, embodies the worries that have drawn the attention of philosophers to their work. Consequently, it is this view that I am concerned with coming to terms, here.

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Kitcher argues that *only some* areas of inquiry are adversely affected by inquirers' interests. Thus, Kitcher argues for a local rather than a global pessimism.

In this paper I critically analyze Kitcher's response to the global pessimist and present my own response. In Section 2, I explain Kitcher's reasons for believing that only certain areas of inquiry are adversely affected by inquirers' interests. In Section 3, I argue that the sorts of biases that Kitcher identifies as having a pernicious effect in certain areas of inquiry affect all areas of inquiry. In Section 4, I argue that the prevalence of such biases does not support global pessimism, contrary to what both Kitcher and the global pessimists suggest. I argue that in order to ensure that hypotheses are not accepted merely because of the interests they serve, the scientific community must include people with diverse interests and background assumptions.

**2. Kitcher's Concerns.** According to Kitcher, the "Millian arena" is an ideal of inquiry, unconstrained by censorship, "in which conflicting ideas battle for public approval on epistemically equal terms" (1997, 291). This ideal, developed and defended by Mill (1859), has been vigorously defended by Paul Feyerabend (1981, 1988; Lloyd 1997). However, not everyone is so optimistic about the power of free inquiry. Alvin Goldman, for example, expresses uncertainty about "how speech should be regulated (or deregulated) for the sake of veritistic ends" (1999, 217). And, as Kitcher notes, some believe that the Millian arena *always* fails "as a device for the eventual disclosure and broadcasting of truth" (1997, 297; italics in original). Kitcher has in mind the Strong Programmers Barry Barnes and David Bloor. According to Kitcher, these *global* pessimists claim that "in *all* areas of inquiry, the conclusions we reach are largely the product of the social and political interests of those who occupy the role of 'makers' (or 'certifiers') of 'knowledge' " (1997, 297; italics in original).

Kitcher shares neither Mill's optimism nor the global pessimists' bleak outlook. He believes that "the Millian arena is an ideal, closely approximated in some areas of inquiry, [but] grossly distorted in others" (1997, 303). He assures us, though, that "the failures of the Millian arena are local" (1997, 297). Consequently, we need not embrace a global pessimism. The challenge raised by the global pessimist, though, is one that Kitcher believes must be taken seriously. As he explains, his own "attempt to regard certain areas of inquiry as diseased parts of a healthy enterprise needs a response to the charge that science, as a whole, is thoroughly subjective and arbitrary" (1997, 299).

Kitcher suggests that the ideal of the Millian arena is realized to a large degree by many physicists, chemists, biologists, and geologists (1997, 301). Where the ideal clearly fails is with respect to inquiries into race, sex, and

gender, that is, "inquiries that bear on struggles to achieve social justice" (1997, 291). As Kitcher explains,

> what is clear from the history of investigations into differences grounded in race, sex, and gender is that mistakes happen with very high frequency, and that they are strongly correlated with the inegalitarian beliefs either of the investigator or of the surrounding society. (1997, 298)

Such inquiries are frequently affected by both political and epistemic asymmetries. A political asymmetry results when:

(i) a particular belief would either become more entrenched or not eradicated if new evidence were uncovered that either supported a hypothesis or its negation, and
(ii) the quality of life of those adversely affected by the prevalence of that belief would either worsen or not improve were that new evidence uncovered. (1997, 281)

In such conditions, the belief in question is impervious to refutation. People are resistant to changing their belief no matter what evidence they are exposed to. As a consequence, the quality of life of those adversely affected by the belief is not apt to improve. This is why Kitcher describes this type of asymmetry as political.

An epistemic asymmetry results when "there [are] significant differences between the objective degree of confirmation and the actual degree of belief . . . with respect to both [a hypothesis and its negation]" (1997, 281). Kitcher is not explicit about what he means by "objective degree of confirmation." I assume that the objective degree of confirmation for a hypothesis would be determined by *all* the data available to a person. It is person-relative. Hence, the objective degree of confirmation for a particular hypothesis might differ between people. For example, the objective degree of confirmation for the hypothesis that the earth orbits the sun is likely higher for a university educated person than a child, but higher still for a professional astronomer.

Kitcher believes that an inquirer's degree of belief for a hypothesis should be proportioned to the objective degree of confirmation. Whenever one's actual degree of belief in a particular hypothesis deviates from the objective degree of confirmation an epistemic asymmetry arises, and people do not treat competing hypotheses symmetrically.[2] Though people may

2. Kitcher has changed what he means by "epistemic asymmetry." In *The Advancement of Science*, two hypotheses are described as "epistemically symmetrical" if two observers, looking at the same thing, would be led to endorse different hypotheses in virtue of their different background assumptions (1993, 224). Thus, epistemic *symmetries* support pessimism. In Kitcher 1997 it is epistemic *asymmetries* that support pessimism.

be willing to change their beliefs, they will demand stronger support for one hypothesis.[3] Kitcher emphasizes that epistemic asymmetries can even arise amongst sincere inquirers. As he explains, "in an epistemically cloudy situation, degrees of belief are nudged away from the objective values by background prejudices, so that sincere investigators incorrectly believe themselves to have a scientific basis for socially acceptable conclusions" (1997, 283). Thus, malice is not necessarily the principal cause of the problem, though it would probably exacerbate the situation.

Kitcher identifies two loci of epistemic asymmetries. One is within the larger community, amongst the people "whose opinions will be formed by what they hear from authorities—people they know, written publications, radio and television" (1997, 302). Kitcher suggests that "within the larger community, there is a tendency for inegalitarian conclusions to receive greater publicity and to be credited with greater authority" (1997, 302). Inegalitarian claims are more salient for three reasons: they come as news because they are contrary to the official egalitarian doctrine; they tend "to resonate with beliefs that are present in muted form"; and they are reassuring to the privileged (1997, 302).

The other locus of asymmetry is amongst scientists—those "who have the educational background to form an opinion on the topic by attending to the evidential details" (1997, 302). Epistemic asymmetries arise amongst scientists because "there are pressures . . . to explore issues about racial and sexual inequality and to defend inegalitarian conclusions" (1997, 302). Such pressures result from the fact that some scientists are attracted to the opportunity to expose "an unsuspected resource in a position that is beginning to look problematic," and "the chance to touch the concerns of a much broader public" (1997, 302–303). Inquiries into race and gender do have implications that concern a broader audience, and racist and sexist views are now looking problematic.

These epistemic and political asymmetries, Kitcher claims, are the sources of our failures to realize the Millian ideal. When people treat competing hypotheses asymmetrically, conflicting ideas do not battle for public approval on epistemically equal terms. But because such failures are local problems, infecting only some areas of inquiry, the concerns of the global pessimists are unwarranted. The conclusions reached in many areas of inquiry are not merely accepted because they serve the interests of the makers of knowledge. Rather, according to Kitcher (1993, 201), generally,

3. The asymmetries that Kitcher calls "political" strike me as being a subclass of epistemic asymmetries. The distinguishing features of political asymmetries are that (1) they have consequences with political implications, and (2) they are the limiting case, where no evidence would change one's mind.

"scientific debates are ultimately closed through the articulation and acceptance of decisive arguments."

Indeed, Kitcher (1997, 298) acknowledges that all scientists are *biased* in virtue of the fact that "experiential knowledge is always dependent on prior concepts and beliefs." Nonetheless, he insists that epistemic biases only *sometimes* "interfere with the proper functioning of the Millian arena" (1997, 297). Some of the processes that people rely on in forming their beliefs, Kitcher claims, "belong to types that have a high propensity to produce true beliefs, others do not" (1997, 298). Thus, even though all belief formation is biased in the sense of being influenced by prior beliefs, not all biases have a bad effect on inquiry. In those areas of inquiry where the Millian ideal is realized, scientists generally rely on biases that have a high propensity to produce true beliefs.

I want to briefly contrast this response to the Strong Programmers with Kitcher's earlier (1993) response to their views. In *The Advancement of Science*, Kitcher was concerned with the Strong Programmers' thesis that "the social forces that operate in [the] modification of [scientific] practice—the rules for consensus shaping, the conversations with peers, the training process and broader socialization within a larger community—may be sufficiently powerful that the effects of nature are negligible" (Kitcher 1993, 162). This is a negative thesis, denying that nature plays a significant causal role in determining the outcome of scientific inquiry. Kitcher is now concerned with the Strong Programmers' positive thesis, that it is the inquirers' interests that determine the outcome of inquiry. In addressing the negative thesis, Kitcher granted that social factors do influence inquiry, but argued that nature also plays a significant causal role (1993, 165). In fact, Kitcher argued that social factors may even play a positive role (1993, 165). In responding to the Strong Programmers' positive thesis, Kitcher grants that inquirers are influenced by interests and background assumptions, but denies that all interests have the same adverse effects. Sometimes, he suggests, an inquirer's interests and biases may have a positive impact on scientific inquiry.

**3. Science and Biases.** In this section I challenge a key claim in Kitcher's reply to the global pessimist that epistemic asymmetries are a local problem, unique to inquiries into race and gender. There is evidence to suggest that the sorts of interests and background assumptions that Kitcher identifies as the cause of epistemic asymmetries affect all areas of inquiry.

Amongst the larger community—i.e., those who form their views on the basis of what they hear from authorities—certain claims may come to be adopted because they are more salient than their competitors. Psychologists have studied the effects salience can have on our judgments. Recent occurrences, because they are cognitively more salient, often lead

people to misrepresent the probability of certain types of events (Tversky and Kahneman 1982, 11). For example, "the subjective probability of traffic accidents rises temporarily when one sees a car overturned" (1982, 11). In Kitcher's terms, one's degree of belief changes even though there is no, or only a negligible, change in the objective degree of confirmation for one's hypothesis regarding the likelihood of traffic accidents. Similarly, people are apt to accept one of two competing views merely because they heard evidence supporting the one view more *recently*. A similar process will lead people to discount new evidence that supports a claim that is contrary to another claim they have heard *frequently* in the past.

One might think that such biases are only apt to give rise to epistemic asymmetries in the larger community, amongst those whose opinions are formed by what they hear from authorities. Miriam Solomon (1994), though, argues that salience affects *scientists* too, those who Kitcher describes as forming their beliefs by attending to the evidential details. Solomon suggests that salience biases affected geologists during the revolution in their discipline in the 1960s. She found that because

> the paleontological and geological similarities observed between currently separated continents in the southern hemisphere are well explained by the hypothesis of drift . . . those working on southern hemisphere materials . . . for whom the data were salient, . . . would take the drift hypothesis to be more strongly confirmed. (1992, 448)

And because "few geologists in the United States worked on southern hemisphere materials . . . the important data in support of drift was not salient to them" (1992, 449). This explains why American geologists were generally slower in accepting the drift hypothesis.

Salience influenced which data geologists regarded as relevant. This contributed to discrepancies between their objective degree of confirmation and their actual degree of belief for competing hypotheses. As a result, some geologists continued to endorse a fixist hypothesis even after the available data provided more support for the drift hypothesis. It is not just a matter of geologists rejecting the drift hypothesis because they did not personally have access to data. Even Pitman, who played an integral role in gathering key data, did not see the significance of his own data until his supervisor pointed it out to him (Glen 1982, 333). Opdyke, Pitman's supervisor, approached the same data with different background assumptions, and was thus able to see the connection between the data and the drift hypothesis.

Individual scientists will always attend to data selectively. This is due, in part, to the fact that the evidential import of the data they have is often opaque to them. Hence, scientists may have access to valuable information

but fail to realize the relevance it has to the issue they are investigating. For example, in a lecture in 1858, Huxley noted the structural similarities between the skulls of sheep, birds, turtles, and carp, but failed to see that this provided evidence of a common ancestry (Ruse 1979, 141). Even when a scientist becomes aware of the evidential import of a body of data, she will often have to convince her peers that her interpretation is the correct one. As Frederick Suppe (1998) explains in his analysis of the structure of scientific papers, "the results are evidence of *something* and the argumentative task of [a] paper is to determine what that *something* is" (403; italics in original).

The opacity of the evidential import of the data that scientists, and people in general, have is a consequence of our limited cognitive capacities. When we are concerned with relations of evidential import, we are concerned to determine how well a hypothesis explains and is empirically supported by the evidence (see Laudan 1984). Stephen Stich, though, has noted that a human mind is incapable of even checking the truth-functional consistency of a belief system containing only 138 propositions (1990, 152). Given that the typical human belief system will consist of far more than 138 beliefs, and determining the *relations of evidential import* between the beliefs in one's belief system is a far more complex task than merely checking for truth-functional consistency, scientists will frequently have beliefs that have evidential import for a hypothesis they are entertaining and yet be unaware of the relevance.

Kitcher may feel that he can address these concerns by drawing a distinction between biases that are truth-conducive and biases which are not. Inquiries into race and gender are frequently influenced by the latter sort of biases, whereas other inquiries are influenced by the former. Indeed, I think that Kitcher is right to insist that not all biases will be an impediment to our pursuit of truth. Even when we attend to data selectively, we may be led to accept the superior hypothesis. As Louise Antony notes, given the amount of information we get from the world, "human knowledge requires biases" (1996, 406). Biases focus our attention and make the difficult task of knowing manageable. But I have two concerns with Kitcher's response to the global pessimist. First, Kitcher has not adequately explained why some scientists can attend to data in a partial or biased manner and still generally arrive at the truth, whereas others, in particular, those who investigate race and gender, generally cannot. Nor has he identified the belief forming processes that inquirers into race and gender allegedly rely on which are responsible for the prevalence of epistemic asymmetries in those domains. Second, I think that it is a mistake to attribute the success we have in certain domains of science to the fact that the *individual* scientists working in those domains are influenced by truth-conducive biases. I argue that it is the social nature of scientific inquiry

that provides the key to answering the concerns raised by the global pessimists.

**4. An Answer to the Global Pessimist.** My argument so far may seem to strengthen the global pessimists' case. Given that epistemic asymmetries are frequently the result of inquirers attending to data selectively, and beliefs that support a person's interests and background assumptions are apt to be more salient to them, people are apt to accept hypotheses that support their interests and background assumptions. I believe that it is this concern that leads Kitcher to try to show that epistemic asymmetries are merely a local problem. In this section, I argue that Kitcher and the global pessimists are mistaken about the connection between epistemic asymmetries and global pessimism. Once we understand how they are related, we will no longer regard the prevalence of epistemic asymmetries as supporting global pessimism.

Both Kitcher and the global pessimist believe that if an individual's interests and background assumptions influence what hypotheses they accept, then they are not apt to judge competing hypotheses symmetrically. They disagree about the extent to which individuals treat competing hypotheses asymmetrically. Kitcher claims that scientists' interests generally do not determine which hypotheses they accept; consequently, he believes that they generally do not treat competing hypotheses asymmetrically. Global pessimists believe that our interests generally do determine which hypotheses we accept; consequently, they believe that individuals generally do treat competing hypotheses asymmetrically.

There are two separate issues here. First, there is the concern that individuals' interests and background assumptions determine which hypotheses they accept, and thus lead them to judge competing hypotheses asymmetrically. Second, there is a social issue. When the scientific community (or the community at large) reaches a consensus there is a risk that the consensus has been determined by the interests and background assumptions of some segment of the population. Kitcher and the global pessimists mistakenly connect the two. Individuals make judgments about which hypotheses to accept on their own, even when they are influenced by what others say. And, each individual may be inclined to accept a hypothesis that supports her own interests and background assumptions. But a particular hypothesis comes to be accepted in the scientific community only after it has been scrutinized by many individuals, and different individuals are moved by different interests and background assumptions.

Given the individualist presuppositions underlying the global pessimists' and Kitcher's accounts of the situation, what needs explaining is how a consensus can *ever* be reached. The global pessimists suggest that

consensus results when some segment of the population gains sufficient power to impose on others the view that serves their own interests. Kitcher suggests that consensus results when many individual scientists, employing a variety of strategies and influenced by different considerations, come to accept the same conclusion.

I argue that we have to look at the social nature of scientific inquiry in order to understand how hypotheses come to be accepted by the community as a whole. Given the social nature of scientific inquiry, the scientific community *can* prevent interests and background assumptions from *determining* which hypotheses are ultimately accepted by the community, and thus ensure that the data plays the role it should in resolving disputes. When scientists make the results of their research public, their results are subjected to scrutiny by other scientists who may not share their interests and background assumptions. As such, the influence that one's interests and background assumptions have on one's evaluation of competing hypotheses is apt to be exposed. Furthermore, any hypothesis that is only acceptable to those who have particular interests or background assumptions is not apt to be widely accepted in the scientific community.

Similarly, the social nature of scientific inquiry ensures that each individual scientist is less likely to disregard relevant data that she has access to in evaluating competing hypotheses. Other scientists, with different interests, will lead them to see the relevance of otherwise neglected data. And when these latter scientists make their findings public, those scientists who previously neglected this data are apt to reconsider their evaluation of the competing hypotheses. They may also be able to see connections between the data and competing hypotheses that were opaque to them before. It is through this social process of making one's results available for public scrutiny, and responding to criticism, that the influences of non-truth conducive biases are eliminated (see Longino 1990, 1993; Wray 1999). Given the social nature of scientific inquiry, the global pessimists' conclusion is not supported even if every inquirer is influenced by their own interests and background assumptions.

The global pessimists' concern is only a genuine threat if some segment of the population that shares the same interests and background assumptions determines which hypotheses the community as a whole accepts. But this concern can be alleviated provided the scientific community is organized in a manner that prevents any segment of the population from having such control.[4] When the scientific community is diverse, insofar as it

4. One way to alleviate these concerns is to organize the institutions constitutive of science in such a manner that no segment of the population can gain undue control. In this regard, see my (2000) "Invisible Hands and the Success of Science."

includes people with a range of interests and background assumptions, the interests and background assumptions of one segment of the population are less apt to determine which hypotheses are accepted. Because different scientists have different interests and background assumptions, each will aid in ensuring that one segment's interests and background assumptions do not necessarily determine what the community as a whole accepts (see Longino 1990, 1993; Wray 1999).

Contrary to what Kitcher suggests, the Millian ideal is attainable even if epistemic asymmetries are pervasive. According to the Millian ideal, competing views should battle for public approval on epistemically equal terms. The equality we are seeking is in the community as a whole, not, as Kitcher implies, within each individual. The Millian ideal enables us to turn our biases to good use. When the community is characterized by diversity, we benefit from having our hypotheses subjected to a wide range of criticism. Despite the fact that each individual scientist may be partial, collectively the scientific community is able to reach a consensus about which view is *epistemically* superior. Our differences are a key epistemic resource, enabling us to see the adverse effects that biases have on our evaluations of competing hypotheses. Indeed, Kitcher (1993) realizes that scientists' differences play a significant role in ensuring that there is an efficient division of cognitive labor, and not all scientists in a particular sub-field work on developing the same theory. But scientific knowledge is a collective accomplishment in a more robust sense: the interaction and exchanges that occur between scientists when they make their views public are constitutive features of science.

Although I disagree with Kitcher about the extent to which inquirers are influenced by epistemic asymmetries, I share his concerns about inquiries into race and gender. In societies where sexist and racist beliefs are widely held, and people's status is determined by their "race" and "gender," competing hypotheses about race and gender will not battle for public approval on epistemically equal terms. Something needs to be done in these areas of inquiry. But as I have suggested, the solution is not to try to reduce epistemic asymmetries. Rather, this sort of problem will require changes to our institutions and practices. Scientific institutions can be structured to ensure that research is scrutinized by people with diverse interests and background assumptions. Additionally, measures can be taken to ensure that those who benefit from the status quo are unable to employ their resources to ensure that their favoured hypotheses are shielded from criticism. Given that inquiries into race and gender bear on struggles to achieve social justice, it isn't surprising that people who currently benefit from the prevailing conception of "justice" employ their resources to preserve the status quo. I suspect that the problems in these domains of inquiry stem from the fact that the existing social institutions

tacitly support inegalitarian views, and thus further shield them from genuine critical scrutiny.

**5. Concluding Remarks.** In summary, I have argued that Kitcher is mistaken about the local nature of epistemic asymmetries. Inquirers' interests and background assumptions are apt to have an adverse effect on all inquiries. But the resulting epistemic asymmetries need not alarm us, for even when epistemic asymmetries are pervasive we need not embrace global pessimism. Moreover, epistemic asymmetries need not be eliminated in order to address the global pessimist. The global pessimists' concerns are ungrounded as long as the scientific community is composed of people with diverse interests and background assumptions. Accordingly, the Millian ideal is realized to the extent that the community is characterized by such diversity.

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